Toward a Linguistic Description of Presuppositions

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Abstract

The present paper is concerned with two problems of presupposition: one is the problem of defining the notion of presupposition toward a unified linguistic theory of presuppositions. This paper tries to reject the logico-semantic account of presuppositional phenomena in favor of a pragmatic one. The other is the problem of the filtering phenomena of presuppositions to be seen in complex sentences. I try to refute Karttunen's (1973) semantic account of them and argue that they can be more adequately explicated in terms of some general conversational (or pragmatic) principles.

0. Introduction

In recent years presupposition has become a central topic in linguistics, and much discussion has been devoted to identifying the presuppositions that certain sentence types have. Yet, the notion of presupposition is not at all well-defined (at least in linguistics), and the discussion usually proceeds on the basis of some pretheoretic notion of presupposition, which naturally differs from linguist to linguist. There are, thus, various usages of presupposition by linguists, examples of which include those in Chomsky (1971), Fillmore (1969, 1971), Keenan (1971), and Kiparsky and Kiparsky (1970). As the case stands, there has apparently been much confusion about what kind of linguistic phenomena can or cannot be justifiably referred to as presuppositions. To dispel such confusion linguists need an adequate definition of presupposition, which is not yet available in linguistics. However, it is no easy matter to define the notion of presupposition in the light of the present poor understanding of what constitutes semantics and pragmatics of natural language, and the confusion is considered due to the lack of a unified linguistic theory of presuppositions of various kinds, which is surely a possibility, independent of a logical theory of presupposition espoused by Strawson and Van Fraassen.[1] Besides, in actual practice linguists usually do not give any explicit definition to linguistic (i.e. semantic or syntactic) concepts such as 'causation', 'volition', 'stative' or 'empathy'. Naturally, presupposition is just another concept yet to be defined by linguists. Linguists' reply to the question of what is the definition of concept X is usually made by such a vague expression as 'a successful definition of this concept would approximate a thorough linguistic analysis of the phenomena involving the concept.' This does not answer the question and even raises another question: "How then do you know what you are talking about?" Then, linguists would respond to this question

by saying, "Native speakers' intuition (in addition to some grammatical criteria)!"; intuition is, thus, always the resolution of the problem of the apparent circular argument in defining linguistic concepts. This strategy by linguists may be puzzling to philosophers and logicians who construct a system on the basis of explicitly defined concepts, but it is a natural consequence of the fact that linguistics is an empirical science, which needs to involve an inductive or 'trial and error' principle as its research strategy, though the ultimate goal of linguists is, just like logicians', the construction of a deductive system from which all the linguistic facts follow.

Now, in what follows, I will first discuss briefly the logical notion of presupposition and some problems which arise when it is applied to natural language, and then, I will turn to the purported examples of linguistic presupposition on the lexical, sentential, and discourse levels to show which of the two approaches, semantic or pragmatic, could offer a viable explanation for the presuppositional phenomena; and I will make an attempt to give a unified characterization of the purported presuppositions on various levels.
Finally, I will discuss what has been called the projection problem: the problem of how presupposi - tions of a complex sentence can be determined by those of the constituent clauses, and then, I will dispute Karttunen's semantic account of it in favor of a pragmatic one.

0.1 There are two basic approaches to presupposition. In one approach presupposition is defined within the truth-conditional semantics as a relation between statements, which is to be contrasted with an entailment relation. This notion of presupposition is generally referred to as logical presupposition. In the other approach presupposition is defined within the realm of pragmatics in terms of what the speaker presupposes as opposed to what he asserts with respect to a linguistic context of an utterance. This notion of presupposition is generally called pragmatic presupposition. Many linguists' approach to presupposition is somewhere between these two; for instance, Fillmore (1969), Langendoen (1971), and Kiparsky and Kiparsky (1970) defined presupposition in terms of what the speaker presupposes as opposed to what he asserts within a use theory of meaning, but there seems to be little substantive difference between logical presupposition and this notion of presupposition, since both approaches assume that presupposition is an intrinsic part of a logical or semantic structure of a sentence.

1. Logical Presupposition

It is generally known that the notion of presupposition has been studied ma ly by logicians and that Frege was the first logician to discuss the notion of presupposition in lo ıc, which was subsequently revived by Strawson (1950) to dispute Russell's theory of description.

Consider the following sentence:

(1) The King of France is bald.

At the present moment there is no king in France, and thus, intuitively speaking, utterance (1) is nonsensical or neither true nor false since (1) is obviously not true and to call it false would be to accept that there exists a king of France while denying that he is bald. However, within Russell's logical framework, (1) is considered as false, for according to Russell, to assert (1) is to assert (2a), (2b), and (2c), each of which is entailed by (1):

(2) a. There is a king of France.

b. There is not more than one king of France.

c. There is nothing which is king of France and is not bald.

(1) is false because at least (2a), which is one of the three entailments, is not true with respect to the present state of affairs.

Strawson, on the other hand, claimed that Russell's strictly extensional logical treatment of sentences like (1) is not congruent with our common sense, which would make us think that the question of whether sentence (1) is true or false does not simply arise when there is no king in France, whose existence is presupposed rather than asserted in (1). Thus, when (1) is used to make a true statement, one who employs it naturally believes there to be a king in France. Since this presupposition is false, the sentence is neither true nor false, but simply out of place.

Strawson wrote:[2]

> "Does he care about it?" "He neither cares nor doesn't care; he's dead." The answer shows that the question is inappropriate to the circumstances...It does not show that the statement that he cared and the statement that he did not care would both be false; it shows rather that the question of which is true does not arise, because the conditions of its arising are not fulfilled."

This account of sentences like (1) or the so-called presuppositional phenomena may have much intuitive plausibility, but common sense arguments or intuitive judgements of truth or falsity cannot be too easily accepted. For common sense or intuition may not be advisable in logical matters. Yet, this presuppositionalist trend in logic has attracted many linguists' attention because of its proclaimed interest in ordinary language.

Strawson then arrived at a more precise formal definition of presupposition on the basis of the difference between presupposition and entailment:[3]

> "It is self-contradictory to conjoin *S* with the denial of *S'* if *S'* is a necessary condition of the truth, simply, of *S*. It is a different kind of logical absurdity to conjoin *S* with the denial of *S*'if *S'* is a necessary condition of the truth or falsity of *S*. The relation between *S* and *S'* in the first case is that *S* entails *S'*. We need a different name for the second case; let us say, as above, that *S* presupposes *S'*."

It seems that this definition of presupposition suffers from the difficulty that when "necessary condition" and "truth or falsity" of the statement are interpreted in the ordinary, truth-functional way,

the definition has the paradoxical consequence that presupposed statements are always true:

S presupposes S' iff
$S \supset S'$
$- S \supset S'$
$\underline{S \vee -S}$
therefore S'

Thus, it cannot be that the presupposition *S'* is false. In fact, according to this definition, every tautology is a presupposition of any statement.

Furthermore, the problem in applying this logical notion of presupposition to natural language is that the definition does not account for the presuppositional phenomena to be seen in non-statements such as interrogatives, and imperatives, which have no truth value. For instance, (3) and (4) also presuppose the unique existence of the King of France just as in (1):

(3) Is the King of France bald?

(4) Kill the King of France.

There is no legitimate reason to regard these presuppositions of non-statements as different from those of statements.

To solve this problem Keenan (1971) extended logic to include interrogative sentences by defining their presuppositions to be the sentences which are logical consequences of every one of their answers; in other words, a presupposition of a question is a sentence which is entailed by every possible answer to it. For instance, (3) has *yes, the King of France is bald* and *no, the King of France is not bald* as the two exclusive alternatives as possible answers, and both of the answers entail the unique existence of the King of France. Keenan (1971) discussed presuppositions in many other contexts; the question *did it surprise Mary that Fred left?* presupposes that Fred left or *who came to see you?* presupposes that someone came to see you, according to the above definition. Keenan's approach to the problem is very attractive in that it works in many cases. However, it does not account for the presuppositions of disjunctive questions. Consider (5):

(5) Did John come to the party or did Mary come to the party?

According to Keenan's definition, this question presupposes that someone came to the party, because the two possible answers *John came to the party* and *Mary came to the party* both entail it. However, (5) has another presupposition; it presupposes that John or Mary came to the party. For if *John or Mary came to the party* is not true, then the question is not sincerely to be asked. What Keenan's definition predicts for (5) is what is called secondary or second-order presupposition, and it fails to predict the primary (first-order) presupposition of the disjunctive question. Thus, the problem with the logical definition of presupposition still remains.

Another problem with the logical notion of presupposition concerns itself with negation. Strawson used the term "denial" rather than "negation", for he obviously distinguished it from the external

negation, which is the negation of a proposition as a whole. What is meant by "denial" (or internal negation) is the negation of some component of a proposition. In discussing the logical notion of presupposition at the substantive level it deserves we need a conceptual understanding of denial.

It is trivially true that whenever any sentence is denied, something positive is made out to be the case or even could be an intended part of what is asserted. Thus, in saying that this desk is not large, we assume that the desk is of some other size, or more precisely, that the desk is the kind of thing which has some size. When we say that the ocean is not black, we assume that the ocean is some other color and is the kind of thing that has color, and when we say that the man next door is not married, we assume that there is such a man. By Strawson's criterion all these cases can be called presuppositions. However, this is not the case with all the forms of denial. In saying that there are no unicorns, we do not assume that there are such things as are called unicorns and in saying that love is not blue, we do not necessarily assume that love is some other color or that love is the kind of thing that has color. If the Strawsonean notion of presupposition is to make sense, these two examples must be regarded as nonsensical, but this is obviously counter-intuitive.

2. Presuppositions in linguistics

In linguistic literature, on the other hand, presupposition is generally defined as opposed to assertion within a use theory of meaning. In this approach, every sentence consists of two aspects of semantic structure: presuppositional and assertive aspects. The assertive aspect of a semantic structure of a sentence expresses the semantic content of illocutionary acts (in the sense of Austin (1962)) such as asserting, asking, ordering, and so forth, while its presuppositional aspect expresses the appropriateness or felicity conditions for successful illocutionary acts. Thus, if presupposition fails, it follows that the performance of the illocutionary act is void or not successful. For instance, asked question (3), one cannot produce any meaningful answer to it. One could simply respond by saying, "I can't answer you, because there is no king in France." Thus, the presupposition of a question is a precondition for a successful interrogative speech act; in other words, the question has to have at least one meaningful answer to it.

The above is a rough outline summation of presupposition discussed by linguists such as Fillmore (1969, 1971) and Kiparsky and Kiparsky (1970). No explicit formulation of this notion of presupposition has been advanced in linguistics, but the criterion for detecting the presuppositions of a sentence is about the same as that of the logical presupposition discussed above: S presupposes S' just in case the assertion of S and the denial of S both imply S'.

2.1 Lexical Presupposition

We have so far discussed two approaches to presupposition in somewhat abstract terms and touched mainly on a simple example of existence presupposition around which philosophers'

discussion of presupposition centers.

Linguists have discussed presuppositions of various kinds – on the lexical, sentential and discourse levels. In what follows I will first describe the presuppositions analyzed by linguists on each of these levels, and then point out some problems.

According to the semantic theory described by Katz and Fodor (1963) and Bierwisch (1969), every lexical item is decomposed into several primitive components or features, which are defined in terms of an entailment relation. For instance, *bachelor* is said to consist of four components [MALE], [ADULT], [HUMAN], and [UNMARRIED], and (6b), (6c), (6d) and (6e) are said to be entailed by (6a):

(6) a. My neighbor is a bachelor.
    b. My neighbor is male.
    c. My neighbor is an adult.
    d. My neighbor is human.
    e. My neighbor is unmarried.

Fillmore (1969) challenged this thesis and argued for the need for the presupposition-assertion distinction in the semantic analysis of nouns and verbs. Fillmore claimed that the semantic content of nouns and verbs consists of two aspects: assertive and presuppositional aspects. For instance, (7) is used to assert that my cousin is unmarried while presupposing that my cousin is a human male adult:

(7) My cousin is a bachelor.

The usual test in detecting the presuppositions of a sentence or a lexical item is to negate the sentence to see what is negated. The basic assumption here is that the presupposed aspect of the meaning of a word or a sentence cannot enter into the scope of negation. Thus, (8) also presupposes that my cousin is a human male adult:

(8) My cousin is not a bachelor.

Presupposition is also said to be constant under questioning.

(9) Is your cousin a bachelor?

If it is the case, one who employs (9) to ask a question necessarily commits himself to the truth of your cousin's being a human male adult.

However, Fillmore's semantic analysis of lexical items in terms of the assertion-presupposition distinction does not work in general. It is relatively clear in the case of *bachelor* what is (normally) presupposed and asserted. But it is not always the case with others. Consider (10):

(10) a. My cousin is a boy.
     b. My cousin is not a boy.
     c. Is your cousin a boy?

The lexical item *boy* may be decomposed into [YOUNG][MALE] and [HUMAN]. Then, intuitively, in saying (10a) one asserts that his cousin is young, while presupposing that his cousin is human male, and in saying (10b), one asserts that his cousin is not young while presupposing that he is human male. In the case of (10c), on the other hand, one can use it to ask whether your cousin is male while presupposing that your cousin is human and young. Or one can use it to ask whether your cousin is a boy or an adult, thus asking whether he is young while presupposing that he is human male. In fact, (10a) and (10b) can be used to assert that my cousin is male (in the case of (10a)) or female (in the case of (10b)), while presupposing that my cousin is human and young. Within Fillmore's approach to presupposition, all this cannot be explained without postulating many *ad hoc* semantic rules. Besides, the Fillmorean semantic analysis of lexical items in terms of lexical presupposition as an intrinsic part of their semantic structure suffers from the difficulty that there is no easy way to account for the presuppositional phenomena to be seen in compound sentences like *is your cousin a bachelor or a spinster?* The purported presupposed aspect of the meaning of *bachelor* fails to be a presupposition for the whole sentence. Then, this example together with the above observation on (10a, b, c) may be taken to falsify the Fillmorean analysis of lexical items. If we are to account for all this, presupposition must be taken to be relative to the relevant discourse context, and I will give a pragmatic account of the above phenomena later on.

2.2 Presupposition on the sentential level

There is a class of predicates called factive predicates which presupposes the truth of their complement clauses:

Factives: regret, ignore, surprise, know, significant, odd, etc.

Non-factives: believe, claim, assert, think, likely, possible, etc.

The difference between the two kinds of predicates may be exemplified as follows:

(11)?John knows that Mary is ill, but in fact, she is not.

(12) John believes that Mary is ill, but in fact, she is not.

Thus, (a) sentences presuppose (b) sentences, respectively in the following examples:

(13) a. It surprised (or didn't surprise) John that Mary left.
b. Mary left.

(14) a. Mary realizes (or does not realize) that John loves Nancy.
b. John loves Nancy.

(15) a. John regrets (or does not regret) that Mary became ill.
b. Mary became ill.

(16) a. It is (not) odd that Fred left.
b. Fred left.

There is another class of verbs called aspectuals which presupposes the truth of the embedded clauses, e.g. *stop, begin, continue,* etc.

(17) a. John has (not) begun to work.
b. John has not been working.

(18) a. John has (not) stopped working.
b. John has been working.

(17a) and (18a) presuppose (17b) and (18b), respectively.

Kempson (1975) argued that presupposition is an unnecessary notion in semantics of natural language, claiming that the purported presupposition is nothing but entailment. On the basis of the following examples she tried to contradict the basic assumption of the proponents of presupposition that the presupposition cannot be negated:

(19) Edward didn't regret that Margaret had failed because he knew it wasn't true.

(20) Sue did not realize that Edward had been unfaithful to Margaret: you must have been mistaken – I know Edward has never been unfaithful.

(21) John has not stopped working. How can he have – he hasn't even started.

The purported presuppositions are negated or asserted to be false in the above examples. Recall that presupposition is such that if it is false, the whole sentence becomes nonsensical, but it is obviously not the case with the examples given above. The problem is to be solved by assuming that the purported presuppositions are entailments. So Kempson's argument goes.

However, it is questionable whether the above use of negation in (19), (20) and (21) is a legitimate or normal one in natural language. Even if so, it does not necessarily follow that presupposition is an unnecessary notion in semantics of natural language, though I believe so.

It has been noted by logicians since the period of the Stoics that there are two kinds of negation: internal and external negation. Kempson's argument is untenable because most linguists and logicians who claim that presupposition is a significant logical or semantic concept would distinguish the internal negation "The King of France is not bald," (which suggests that there is such a person) from the external negation "It is not the case that the King of France is bald," (which would be true even if there were no such person), and they would assume that the notion of presupposition is only to be studied on the basis of internal negation. Kempson's refutation of the thesis that presupposition is a necessary logico-semantic concept is based on the assumption that negative sentences are not ambiguous. However, this assumption is not empirically motivated. Observe (22):

(22) a. John didn't realize that Mary was sick.
b. It is not the case that John realized that Mary was sick.

(22a) strongly suggests that Mary was sick, while (22b) does not. For even if *Mary was sick* is false, (22b) could be true. (Incidentally, it should be noted that the thesis that all negative sentences

can be reduced to such a form as "It is not the case that . . ." can be maintained only if the sentences are analyzed into full-fledged logical forms as "It is not the case that for some x, x is such and such.") In fact, (22a) could be interpreted, though marginally, as containing external negation. If we examine Kempson's examples in this light, then they can be considered as examples of external negation. Thus, they do not disprove the logico-semantic theory of presupposition.

Then, when we assert or deny that John knows that Mary left, we necessarily presuppose that Mary left or when we assert or deny that John regrets that the house was burnt down, we necessarily presuppose that the house was burnt down. However, the problem is that the denial (or internal negation) is not in accord with negation in natural language. The relation of being a 'denial of' is purely a logical relation between two propositions: if the denial is true, then the proposition of which it is the denial is false, and vice versa. The relation of being a 'negation of', on the other hand, is a syntactically defined relation: a sentence is a negative sentence by virtue of an occurrence of "not" in its main verb phrase. Thus, there are cases where the negation of a sentence does not correspond to its denial. For instance, the negative sentence *John didn't run* is not at all contradictory to the affirmative sentence *John ran* in a particular context where John in fact rushed.

Thus, in the light of the fact that a syntactically defined negation is not to be equated with a logically defined denial for empirical reasons, it may not be advisable for linguists to study presupposition in terms of the logical concept of denial in order to come to grips with what linguists would wish to understand by the term "presupposition", though denial is a useful notion for logicians. The salient characteristic of negation in natural language is its ambiguity, and although many linguists would claim that *John does not know that Mary left* entails that Mary left just as *John knows that Mary left* entails it, it should be noted that the negative sentence in question entails it just in case the negation is semantically interpreted as the denial, but that it does not entail that Mary left if the negation refers to the syntactically defined negation and is not semantically interpreted as the denial. For even if Mary did not leave, the sentence may be true in a certain context where John does not know what Mary did, but John simply claims that Mary left.

This does not mean that the purported presuppositional phenomena are in doubt. It is clear that there are phenomena to be explained, but the question is what kind of explanation should be given. My claim here is that the thesis that presupposition is an intrinsic part of the logical or semantic structure of a sentence does not enable us to come to grips with the presuppositional phenomena. I argue that the presuppositional phenomena are essentially pragmatic, and should be defined with respect to the relevant linguistic context. The linguistic notion of presupposition is the closest to the so-called background assumptions. Rational conversation can only proceed on the basis of such background assumptions shared by the speaker and the addressee, which constitute the linguistic context. According to this conception, to presuppose something is for the speaker to take its truth

for granted and to assume that the addressee does so also. For instance, when I say that my cousin is a bachelor, I take it for granted that my cousin is a human male adult and assume that the addressee does the same in the most likely context, but in a particular, though less common, context where the speaker and the hearer already understand that my cousin is an unmarried adult, the same sentence could be used to inform the hearer that my cousin is male as a response to the hearer's relevant information-seeking question: *is your cousin a bachelor or a spinster?*

Surely, the latter context is much less likely to occur but possible.

The question to answer is why it is the case that in saying that my cousin is a bachelor, we normally presuppose that my cousin is a human male adult, and much less normally presuppose that my cousin is a human unmarried adult. I propose that this problem is to be solved in terms of a very general conversational principle, that is, what Grice called the informative principle, which is one of the general conversational maxims.[4] The amount of information which the component of *bachelor* [UNMARRIED] carries is much larger than that of the component of *bachelor* [MALE]; to put it the other way around, [MALE] is notionally broader than [UNMARRIED]. Then, it is trivially true that rational conversation is not to be carried on by iterating what has been already understood or taken for granted but by giving and seeking new information. According to Grice's informative principle, the speaker normally makes his contribution as informative as is required. From this it follows that what tends to be presupposed is a less informative aspect of the meaning of a lexical item (and presumably, a sentence too) ; to put it in other words, what tends to be asserted is the most informative aspect of the meaning of a word.

Turning to factives, which are harder to deal with, I will simply dispute the semantic account of the presuppositional phenomena with the following examples:

(23) a. Chomsky knows that grammar is finite, so grammar is finite.

b. Chomsky does not know that grammar is finite, but grammar is finite.

Compare these with the putative examples of presupposition:

(24) a. ?All of John's children are smart, so John has children.

b. ?All of John's children are not smart, but John has children.

There is nothing semantically odd with (23a) and (23b). If their complement clauses are taken to be presupposed, it is semantically superfluous to assert them again. It is true that when we assert or deny that Chomsky knows that grammar is finite, we normally take it for granted that grammar is finite, but it is also possible for the speaker to say that Chomsky knows (or does not know) that grammar is finite, without taking it for granted that grammar is finite in a particular context where the truth of the complement is in dispute between the speaker and the hearer.

One might object to my claim on the ground that either such a use of the verb 'know' is not normal or the verb 'know' of the above sentences is different from the factive predicate 'know'.

However, the objection is groundless. First, the sentences are not at all semantically anomalous. Second, if we set up two kinds of 'know', we need to set up two kinds of 'regret', 'discover', 'realize', and every other factive predicate. This can be easily seen by replacing 'know' by other factive predicates. (Incidentally, note that (23a) is no longer semantically well-formed if we replace *that* by *if*.)

Thus, although factive predicate constructions tend to strongly suggest that the truth of their complements is taken for granted in the most likely context, it is not necessarily the case, and it depends on the linguistic context in which they take part.

2.3 Discourse Presupposition

Briefly I will discuss what I call discourse presuppositions. Chomsky (1970) and Jackendoff (1972) have demonstrated independently that the scope of negation is bound up with focus in a sentence, and that (25), for example, may be understood in several ways with respect to the scope of negation:

(25) John didn't stop beating his wife.
  a. but Mike did. (*John* is the scope of negation)
  b. but he started beating his wife. (*stop* is the scope of negation)
  c. but he stopped loving his wife. (*beating* is the scope of negation)
  d. but he stopped beating his sister. (*his wife* is the scope of negation)

Although Chomsky and Jackendoff attempted to solve the problem of the scope of negation in terms of rules of semantic interpretation within the realm of sentence grammar, the scope of negation may be best considered as determined in relation to some relevant discourse or what I call discourse presupposition, which is contrasted with focus.

Then, (a) sentences presuppose (b) sentences, respectively in the relevant discourse context:

(26) a. John didn't stop beating his wife, (but Mike did).
  b. Someone stopped beating his wife.

(27) a. John didn't stop beating his wife, (but he started beating his wife).
  b. John either stopped or started beating his wife.

(28) a. John didn't stop beating his wofe, (but he stopped loving his wofe).
  b. John stopped something.

(29) a. John didn't stop beating his wife, (but he stopped beating his sister).
  b. John stopped beating someone.

This kind of presupposition has been distinguished from the kind of presupposition that we have discussed above on the ground that the latter has been regarded as being inherent in the semantic properties of certain sentence types, and the former is not associated with any particular sentence types, but varies according to the discourse context. Surely, no logical or semantic account can be

given to this discourse presupposition, which can only be accounted for in terms of the pragmatic notion of presupposition, i.e. by the background assumptions shared by the speaker and the addressee. Thus, it seems to me that the most promising way to give a unified characterization of presuppositions of various kinds – on the lexical, sentential, and discourse levels, is a pragmatic approach to presupposition.

2.4 Presuppositions in interrogative sentences

Now, in what follows, after discussing some presuppositions to be seen in interrogative sentences, I will make some proposals toward a unified linguistic description of presuppositions.

In linguistic literature there have been several kinds of presuppositions proposed for interrogative sentences. Given below are some examples of them.

(i) wh-questions;

(a) Who broke the window?

According to Katz and Postal (1964) and Katz (1973), this wh-question presupposes that someone broke the window. It is obvious that the logical definition of presupposition is not adequate in this case, since its negative counterpart *who didn't break the window* does not entail *someone broke the window.*

(b) When did John go to California?

This question presupposes that John went to California.

(c) How long did John wait for Mary?

This question has the presupposition that John waited for Mary.

(ii) disjunctive questions.

(a) Did John or Bill come here?

A disjunctive question has been considered as having a disjunctive presupposition; either John or Bill came here.

(b) Did John come or not?

This sentence has a tautological presupposition such as *John came or John didn't come.*

(iii) yes-no questions.

(a) Did Mary come?

In transformational grammar yes-no questions have been analyzed as deriving from the underlying disjunctive form such as *did Mary come or not* and thus, it has a tautological disjunctive presupposition just like a surface disjunctive question.

(iv) yes-no questions with adverbs.

(a) Did John study enthusiastically?

This sentence, according to Lakoff (1965), presupposes that John studied (at least on one reading of

the question in which the scope of questioning is the adverbial.)

None of these presuppositions follow from the logical definition of presupposition. Conversely, one could argue that these cases are something other than presuppositions by definition. Nevertheless, I presume that the best definition is such that it is general enough to predict these cases and yet restrictive enough to reject pseudo-presuppositions. It goes without saying that it is not *a priori* determined what are real presuppositions and what are not. Then, assuming that it is a legitimate claim that the above cases should also be considered as presuppositions, we need a definition general enough to predict the above presuppositions as well as the others to be predicted by the logical definition of presupposition.

3. Now, I will make the following proposal: let the presupposition of S(entence), whatever illocutionary act it may express, be defined as S v not S (where the negation is a syntactically defined negation), and if S is in the form of a disjunction, then it has the disjunction as its presupposition. The scope of negation is determined in relation to the linguistic context. Furthermore, adopting the Russelean logical framework, I assume that the purported logical presuppositions are entailments. Thus, presuppositions do not constitute any part of a logical or semantic structure of a sentence, but all the alleged presuppositions are deducible from the above definition by virtue of their being logically equivalent to the presupposition defined above. For example, according to the logical definition of presupposition, *the King of France is bald* presupposes the unique existence of the king of France because this statement and its denial both entail it. On the other hand, according to our definition of presupposition, *the King of France is bald* presupposes *the King of France is bald or the King of France is not bald,* and its logical form consists of the following three entailments:

(a) There is a king of France. (referred to as p)

(b) There is not more than one king of France. (referred to as q)

(c) There is nothing which is king of France and is not bald. (referred to as r)

Provided that the scope of negation is (c), determined in relation to the relevant linguistic context, the logical form of the presupposition is (p & q & r) v (p & q & -r). Then, this form is logically equivalent to (p & q), namely the unique existence of the king of France.

The advantage of our definition is that it can solve a perplexing problem which the semantic account of presupposition faces. We have discussed that the word bachelor consists of three presupposed components [HUMAN] [MALE] [ADULT], and one asserted component [UNMARRIED]. We have also seen that the following example is a counterexample to this claim.

(30) Your cousin is a bachelor or a spinster.

This sentence presupposes rather than asserts that your cousin is unmarried. Within our approach, (30) has a disjunctive presupposition; your cousin is a bachelor or a spinster, the logical form of which is roughly given as (your cousin is unmarried & human & male & adult) v (your cousin is

unmarried & human & -male & adult). This logical form is equivalent to what is taken to be a presupposition of (30). Thus, presupposition has no intrinsic content in the semantic structure of a word or a sentence, but it can be inferred from the logical form of a sentence, given the above definition of presupposition.

As for the presuppositions of interrogative sentences discussed above, it can be easily shown that our definition of presupposition works in all these cases. First, it can, though trivially, takes care of the cases of (ii) and (iii). As for (iv), some comments are in order. As has been suggested in several syntactic analyses of manner adverbials, a sentence involving a manner adverbial such as *John studied enthusiastically* may be best considered as deriving from the underlying compound sentence like *John was enthusiastic* and *John studied,* to put details aside. Provided that this underlying form corresponds roughly to its logical form, we have the following presupposition for *did John study enthusiastically*?

(31) ((John was enthusiastic) & (John studied)) v (-(John was enthusiastic) & (John studied))

Provided that the scope of negation is *John was enthusiastic,* from the above logical form, it can be inferred that John studied, which is the alleged presupposition.

As for wh-questions, we have discussed that (32) presupposes (33):

(32) Who broke the window?

(33) Someone broke the window.

However, (33) is not a precise form of presupposition, but its precise form is (N_1 v N_2 v N_3 . . .) broke the window, where N_i is a human noun referred to in a relevant discourse context. Given a particular discourse context where John, Tom, and Mary are referred to, (32) may be paraphrased as (34):

(34) Did John break the window or did Tom break the window or did Mary break the window?

Semantically, wh-questions and disjunctive questions are closely related, and may be considered as deriving from the same underlying structure. Based on this assumption, our definition of presupposition is valid in the case of wh-questions too.

4. Presuppositional phenomena in complex sentences

This section is concerned with presuppositional phenomena to be seen in complex sentences, and more specifically, it is concerned with what Langendoen and Savin (1971) called projection problem; the problem of how the presuppositions of a complex sentence can be determined by those of the clauses it contains. This problem has been discussed, above all, by three important papers: Morgan (1969), Langendoen and Savin (1971) and Karttunen (1973). I will discuss Karttunen's solution of the problem, and after pointing out some of its inadequacies, I will give an account of the presuppositional phenomena in complex sentences on the basis of some simple and general conversational (or pragmatic) principles.

The most important hypothesis concerning the projection problem to which many linguists subscribe is what Morgan called cumulative hypothesis.

According to this hypothesis, the presuppositions of a complex sentence is a total sum of the presuppositions of its constituent clauses plus those of the main clause. For example, consider (35):

(35) a. All of John's children are college students and he stopped supporting them financially.
b. John has children.
c. John used to support his children financially.

The first conjunct of (35a) presupposes (35b) and its second conjunct presupposes (35c). The compound sentence as a whole presupposes both (35b) and (35c), as is predicted by the cumulative hypothesis. Consider another example:

(36) a. John regretted that he stopped beating his wife.
b. John stopped beating his wife.
c. John used to beat his wife.

(36a) presupposes (36b), which in turn presupposes (36c). (36a) also presupposes (36c). Thus, the presuppositional relation is transitive: if A presupposes B and B presupposes C, then A presupposes C. (cf. Lakoff (1972)) (36b) has been referred to as primary (or first order) presupposition, and (36c) as secondary (or second order) presupposition.

Although the cumulative hypothesis is basically right as can be seen in the above examples, it does not work in general, as was pointed out by Karttunen (1973). Consider (37) and (38):

(37) Bill ordered Fred to stop beating Zelda.

(38) Bill forced Fred to stop beating Zelda.

Although the embedded clause presupposes that Fred used to beat Zelda, (37) itself has no such presupposition, while (38) as a whole presupposes what is presupposed by the embedded clause. In this regard I will cite Karttunen's words (1973):

> "For example, assume that Bill mistakenly believed that Fred was beating Zelda and ordered him to stop. In reporting on what Bill did, the speaker does not have to commit himself to the false belief which led him to issue his order . . ."

I presume Karttunen's observation, though controversial, is correct, but one might argue that if we are to define the notion of presupposition as felicity conditions for utterances, (37) might as well be considered as presupposing that Fred used to beat Zelda, otherwise the performance of the illocutionary act would be void. However, recall that the speaker, rather than sentences, has presuppositions within a pragmatic account of presuppositions. Then, one can think of an appropriate context in which (39) is uttered felicitously, while (40) cannot be uttered in any possible context:

(39) John ordered Mary to stop beating Zelda, and Mary got mad because she didn't beat Zelda.

(40) #John forced Mary to stop beating Zelda, but Mary got mad because she didn't beat Zelda.

The symbol # indicates that the sentence which follows it is not admissible in any context. Thus, the so-called performative verbs suspend the presuppositions carried by the embedded clause. Karttunen (1973) referred to these verbs as *plugs*, which block off all the presuppositions of their constituent clauses.

Karttunen also discussed cases where the presuppositions of the constituent clauses fail to be presuppositions for the whole sentences under certain conditions. Such predicates as filter out those presuppositions under certain conditions were called *filters,* which include logical connectives *and, if ... then,* and *either ... or.* Specifically, Karttunen discussed how to distinguish cases like (41), where the cumulative hypothesis works, from those like (42) and (43), where it fails:

(41) If baldness is hereditary, then all of Jack's children are bald.

(42) If Jack has children, then all of Jack's children are bald.

(43) If it is true that Jack hasœchildren, then all of Jack's children are bald.

The consequent of each of these sentences presupposes that Jack has children, but only (41) as a whole does have the presupposition, (while (42) and (43) have no such presupposition.) A cursory examination of these examples will reveal that there is a certain relationship between the antecedent and the consequent: the antecedent corresponds to the presupposed sentence of the consequent as in (42) or the antecedent entails it as in (43). The presupposition of the antecedent, on the other hand, never fails to be a presupposition for the whole sentence. On the basis of this observation, Kartunen proposed the following filtering conditions for *if ... then* sentences:

(44) Let S stand for any sentence of the form "If A then B"

(a) If A presupposes C (A $\gg$ C), then S presupposes C (S $\gg$ C)

(b) If B presupposes C (B $\gg$ C), then S presupposes C (S $\gg$ C)
unless A semantically entails C (A%C).

A semantically entails *B* if and only if *B* is true whenever *A* is true.

Observe the following examples:

(45) If Fred has managed to kick Cecilia, he will kick her again.

(46) If Fred is married, his wife is no longer living with him.

The consequent of (45) presupposes that Fred has kicked Cecilia before, and its antecedent semantically entails it. In the case of (46), its consequent presupposes that he has a wife, and this presupposition is semantically entailed by the conditional clause. Thus, the above filtering conditions can correctly predict that (45) and (46) do not have the presuppositions of their consequents.

Karttunen observed that conjunctions behave just like conditionals:

(47) a. Jack has children and all of his children are bald.

b. It is true that Jack has children and all of his children are bald.

c. Fred has managed to kick Cecilia and he will kick her again.

d. Fred is married, and his wife is no longer living with him.

The second conjuncts of these sentences have their respective presuppositions, which fail to be presuppositions for the matrix sentences. Karttunen observed that the presuppositions are filtered out only when the two conjuncts are semantically related. Thus, as can be seen in the sentences below, semantically unrelated conjuncts retain the presuppositions of each conjunct:

(48) a. All of Jack's children are bald, and he regrets being bald.

b. Baldness is hereditary and all of Jack's children are bald.

As is the case with conditional sentences, the presuppositions are filtered out when they are semantically entailed by the antecedents. Thus, Karttunen set up the same condition for conjunctions as for conditionals.

The last connective that Karttunen (1973) discussed is *either . . . or.* Karttunen's filtering condition associated with *either . . . or* is slightly but significantly different from the previous one. Karttunen's examples are given below:

(49) a. Either Jack has no children or all of Jack's children are bald.

b. Either it is false that Jack has children or all of Jack's children are bald.

c. Either Bill has always refrained from beating his wife or Bill has already stopped beating her.

d. Either Harry is not married at all or his wife is no longer living with him.

In all these cases the second disjunct has a presupposition which does not become a presupposition for the whole disjunction. It can be easily seen that in each case the suppressed presupposition of the second disjunct is semantically entailed by the negation of the first clause. On the basis of observation, Karttunen set up the following filtering condition for *either . . . or:*

(50) Let S stand for any sentence of the form "Either A or B"

(a) If A $\gg$ C, then S $\gg$ C

(b) If B $\gg$ C, then S $\gg$ C unless -A % C

The difference between the two conditions, (44) and (50) should be noted: the filtering condition associated with *and* and *if . . . then* filters out presuppositions on the basis of what is entailed by the first or antecedent clause, while the filtering condition associated with *either . or* does so on the basis of what is entailed by the negation of the first disjunct.

Although Karttunen's filtering conditions work in many cases, they fall short of being correct. In what follows I will point out some cases where Karttunen's filtering conditions do not work. First, consider the following sentence:

(51) It is possible that John has children and it is possible that all of his children are not living with him.

Note that the second conjunct presupposes that John has children, but that this presupposition is not entailed by the first conjunct. The fact that (51) does not have the presupposition of the second conjunct does not directly follow from Karttunen's filtering condition associated with *and*. I presume Karttunen would solve this problem in terms of the equivalence of (52a) and (52b):

(52) a. It is possible that A and it is possible that B.

b. It is possible that A and B.

Then, the filtering condition is applied to the embedded conjunction, thus correctly blocking off the presupposition of the second conjunct of (51). Next, consider the following examples:

(53) Probably John has children and probably John's children are not living with him.

(54) John may have children and John's children may not be living with him.

Neither of these two sentences has the presupposition of the second conjunct, and this fact can only be explicated by postulating the following rather abstract underlying forms for the above sentences:

(55) a. (=53) It is probable that A and it is probable that B.
= It is probable that A and B.

b. (=54) It may be that A and it may be that B.
= It may be that A and B.

However, Karttunen's filtering condition works only when the two modals are the same, and the following example in which the two modals are different reveals a serious problem with his condition:

(56) John must have children, and probably John's children are not living with him.

(56) may be paraphrased as (57):

(57) It must be that John has children, and it is probable that John's children are not living with him.

There is no way to get the contracted form of (57), so that Karttunen's filtering condition cannot be applied. Thus, within Karttunen's approach, there is no filtering out the presupposition of the second conjunct.

Another serious problem with Karttunen's filtering condition associated with *and* is revealed by the following examples:

(58) It is probable that John has no children and it is equally probable that John's children are not living with him.

(59) One possibility is that John has no children and another possibility is that John's children are not living with him.

(60) It can be that John has no children and it can also be that John's children are not living with him.

The problem is that the above forms are not equivalent to their corresponding contracted forms. Note that the embedded conjunctions are contradictory; for instance, observe (61):

(61) It is probable that John has no children and John's children are not living with him.

Even if the problem can be gotten around in some way or other, the filtering condition associated with *and* cannot be applied, since the purported presupposition is entailed not by (the embedded clause of) the first conjunct, but by its negation. Then, in order to filter out the presupposition the filtering condition associated with *either . . . or* must be applied, but then, it follows that there are two kinds of *and*: one kind of *and* is such that the filtering condition associated with *and* and *if . . . then* is applicable to it, and the other kind of *and* is such that the filtering condition associated with *either . . . or* is applicable to it. However, within Karttunen's formulation of the filtering conditions, there can be no principled way to distinguish between the two kinds of *and*.

The same problem arises when we examine compound sentences involving *but*. First, observe the following sentence:

(62) John has stopped beating his wife, but he still resents her infidelity.

The first clause of (62) presupposes that he has been beating his wife, and its second clause presupposes that John's wife has been unfaithful to him. These two presuppositions become presuppositions for (62) as a whole. On the other hand, when the two clauses are semantically related, the presuppositions of the second conjunct fail to be presuppositions for the whole sentence as can be seen in the examples below:

(63) a. John has been beating his wife, but he has stopped beating his wife.

b, John is married, but his wife doesn't live with him any more.

c. John has children, but all of his children live away from him.

d. John has managed to kick Cecilia, but he won't kick her again.

Thus, just as in the case of *and*, when the presupposition of the second clause is semantically entailed by the first clause, it is filtered out. However, this is not the case with all forms of conjunctions containing *but*. Oberve the following sentences:

(64) a. Probably John isn't married, but probably John's wife is living apart from him.

b. It is possible that John has no children, but it is equally possible that John's children are not living with him.

Provided that the filtering condition should be applied to the contracted forms of the above sentences, the filtering condition associated with *either . . . or* must be applied if the presupposition is to be filtered out, since it is entailed by the negation of the first clause. Yet, Karttunen's approach has no easy way to predict which of the two filtering conditions should be applied.

Furthermore, the filtering conditions based on the semantic entailment relation do not work in general in the light of the following example:

(65) It may be that John has stopped beating his wife, but it may also be that John hasn't

begun beating his wife.

Note that the first conjunct presupposes that John has been beating his wife and that the second conjunct presupposes that John has not beaten his wife. Neither of these two contradictory presuppositions becomes a presupposition for the whole sentence. This fact does not follow from Karttunen's filtering condition, which filters out the presupposition of the second clause only when it is semantically entailed by (the negation of) the first clause, but not when it is presupposed by it.

The same problem is revealed by the following example:

(66) Either John hasn't begun singing or John has stopped singing.

The two disjuncts have contradictory presuppositions, neither of which becomes a presupposition for the whole disjunction. Obviously, this fact does not follow from Karttunen's filtering condition, either.

Now, I will give my account of the phenomena. First, consider the following sentences:

(67) a. John has children, and all of his children are bald.

b. If John has children, then all of his children are bald.

c. It is possible that John has children and that all of his children are bald.

Karttunen, as we have seen, treated the filtering phenomena of presuppositions seen in these examples in terms of the same filtering condition, but I presume that the way the presupposition is filtered out in (67a) is different from the way the presupposition is filtered out in (67b) and (67c).

It is trivially true that discourse proceeds from old information to new information: this fact is in accord with what Grice (1968) called the informative principle, which we have discussed earlier. The anomalous nature of the following sentence is predicted by this principle:

(68) ?All of John's children are bald, and John has children.

The problem with (68) is that what is asserted by the second clause does not add any new information but simply iterates the already understood information. Thus, what is given as old information or presupposition at the beginning of an utterance will stand as presupposition throughout. On the other hand, what is asserted at the beginning of an utterance will stand as an assertion throughout whether or not it may be repeated as a presupposition later on in the utterance. Thus, I will set up the following hypothesis:

(69) What has been asserted within an utterance is not to be presupposed by the whole utterance.

In the case of (67b), the situation is somewhat different. For one thing, the presupposition of the consequent is made with respect to the conditional world rather than to the real world. Thus, the speaker does not commit himself to the truth or falsity of the proposition.

For another, a simple sentence could filter out a presupposition if the presupposition is qualified by the previous utterance or by the discourse context. Consider (70):

(70) Suppose John has children. John's children are bald.

The second sentence does not presuppose that John has children, since the presupposition is qualified by the previous utterance. Now, consider the following sentence:

(71) My child will be bald.

(71) is said to presuppose that I have a child, but I presume that the above sentence is ambiguous. The ambiguity will be easily seen if we consider a certain discourse context. Assume first that I am bald and don't have any children. Assume further that I was told by the doctor that baldness is hereditary. In such a context (71) can be sincerely uttered without presupposing that I have a child. I am not claiming that this is a syntactic ambiguity, but what I am claiming is that given a certain context, the above sentence does not necessarily presuppose that I have a child. The point here is that the purported presupposition may be qualified by some assumed facts (or supposed facts) in the discourse context, and that presuppositions may be filtered out when qualified by the previous utterance or by what is implicated by the discourse context.

Next, consider the following sentence:

(72) It is possible that John has children, and that his children are bald.

The presupposition of the second clause is made with respect to the modality world: in other words, the speaker does not commit himself to the truth or falsity of the proposition. Thus, just like conditionals, the presupposition is qualified by the preceding sentence. Consider the following sentence:

(73) It is possible that John's children are bald.

In saying (73), we normally presuppose that John has children, but given a particular context where the purported presupposition is made with respect to the modality or conditional world, then (73) could be sincerely uttered without presupposing that John has children. For instance, the following sequence of utterances could filter out the presupposition:

(74) a. Suppose John has children. It is possible that his children are bald.

b. Probably John has children. It is possible that his children are bald.

In fact, these qualifying utterances do not have to be explicitly stated, but have only to be implicated in the discourse context so as to filter out the purported presuppositions.To sum up, we can set up the following principle.

(75) If the speaker does not commit himself to the truth or falsity of a proposition within the utterance or in the discourse context, the proposition is not to be presupposed.

It could be said, as was suggested by Morgan (1969), that those presuppositions are not filtered out, but they stand as presuppositions with respect to some possible world. However, this position is untenable because it means a radical departure from the basic assumption of the pragmatic conception of presupposition that to presuppose something is for the speaker to take its truth for granted (with respect to the real world), and assumes that the addressee does the same.[5]

The problematic examples containing *and* or *but* where Karttunen's filtering conditions do not work are repeated below:

(76) It is probable that John has no children and it is equally probable that his children are not living with him.

(77) Probably John isn't married, but probably John's wife is living apart from him.

(78) It may be that John has stopped beating his wife, but it may also be that John hasn't yet begun beating his wife.

All these cases can be explicated in terms of the Gricean notion of conventional implicature.[6] That is, any sentence of the form "Modal A and (or but) Modal B" where A and B are not consistent *conventionally* implicates "Either A or B". Then, the presuppositional phenomena seen in these constructions as well as in *either . . . or* constructions can be accounted for in terms of the definition of presupposition given in section 3.

5. Concluding remarks

We have discussed two problems of presupposition: one was the problem of defining the notion of presupposition toward a unified linguistic theory of presuppositions. I have disputed the logico-semantic account of presuppositional phenomena in favor of a pragmatic account of them, which I have sketched in this paper. The other problem was how the filtering phenomena of presuppositions in complex sentences should be characterized. I have argued that they should not be explained in semantic terms, but thatt they can be more adequately explicated in terms of very simple general conversational (or pragmatic) principles.

Notes:

1. In extending classical logic to explicate presuppositions Van Fraassen has constructed a system of supervaluations for presuppositional languages, which is said to be superior to truthfunctional threevalued systems developed by other logicians. For details of Van Fraassen's theory, see Van Fraassen (1969), 'Presuppositions, supervaluations, and formal logic', in K. Lambert, ed. *The Logical Way of Doing Things,* Yale University Press, New Haven.
2. P. F. Strawson, *Introduction to Logical Theory* (London: Methuen, 1952) p. 18.
3. Ibid., p. 175.
4. For details of Grice's theory, see Grice, H. P. (1968) 'Logic and conversation' Mimeo. An extract from this work is published under the same title in Davidson and Harman, eds. *The Logic of Grammar* (Dichenson Publishing Co., Encino, California, 1975)
5. However, the notion of possible worlds is very important in explicating some presuppositional phenomena. For instance, consider the following sentence: *If John had failed in the exams, he would have regretted it.* This sentence may be paraphrased as *If John had failed in the exams, he would have regretted that he failed in them.* Note that the complement of the verb 'regret' is presupposed. However, the subjunctive *if* clause presupposes that John did not fail in the exams. If the cumulative hypothesis were correct, it would follow that this sentence has two contradictory presuppositions. This fact can be explained by assuming that the two contradictory

presuppositions are made with respect to two different possible worlds.

6. The uttering of this sentence licenses the implication that either A or B, though this proposition is not logically entailed by the sentence. This implicature is conventional (and not conversational) because it depends on the meanings of the lexical items and the grammatical construction.

References

Austin, J. L. (1962). *How to Do Things with Words,* Oxford University Press. New York.

Bierwisch, M. (1969). 'On certain problems of semantic representation', *Foundations of Language,* 5, 153–84.

Chomsky, N. (1971). 'Deep structure, surface structure and semantic interpretation', in Steinberg, D. D. and L.A. Jakobovits, eds. *Semantics,* 183–216. Cambridge University Press.

Fillmore, C. J. (1969). 'Types of lexical information', in Kiefer, F. ed *Studies in Syntax and Semantics,* 109–37. Dordrecht.

Fillmore, C. J. (1971). 'Verbs of judging: an exercise in semantic description', in Fillmore, C. J. and D. T. Langendoen, eds. *Studies in Linguistic Semantics,* 273–89. Holt, Rinehart & Winston.

Heringer, J. T. (1972). 'Some grammatical correlates of felicity conditions and presuppositions', in *Working Papers in Linguistics,* No.11, Ohio State University, Columbus.

Jackendoff, R. (1972). *Semantic Interpretation in Generative Grammar,* MIT Press, Cambridge, Massachusetts.

Karttunen, L. (1973). 'Presuppositions of compound sentences', *Linguistic Inquiry,* IV, 169–93.

Katz, J. J. (1973). 'On defining "presupposition",' *Linguistic Inquiry,* IV, 250–60.

Katz, J. J. and J. A. Fodor (1963). 'The structure of a semantic theory', *Language,* 39, 170–210.

Katz, J. J. and P. M. Postal (1964). *An Integrated Theory of Linguistic Descriptions,* MIT Press, Cambridge, Massachusetts.

Keenan, E. L. (1971). 'Two kinds of presupposition in natural language', in Fillmore, C. J. and D. T. Langendoen, eds. 45–54.

Kempson, R. M. (1975). *Presupposition and the Delimitation of Semantics,* Cambridge University Press, New York.

Kiparsky, P. and C. Kiparsky (1970). 'Fact', in Bierwisch, M. and K. Heidolph, eds. *Progress in Linguistics,* 143–73. Mouton.

Kuroda, S.-Y. (1974). 'Geach and Katz on presupposition', *Foundations of Language,* 12, 177–99.

Lakoff, G. (1965). 'On the nature of syntactic irregularity', Report No. NSF-16, The Computation Laboratory of Harvard University.

Lakoff, G. (1972). 'Linguistics and natural logic', *Synthese* 22, 1/2, 151–271.

Langendoen, D. T. (1971). 'Presupposition and assertion in the semantic analysis of nouns and verbs in English', in Steinberg, D. D. and Jakobovits, eds. *Semantics,* 183–222. Cambridge University Press.

Langendoen, D. T. and H. B. Savin (1971). 'The projection problem for presuppositions', in Fillmore, C. J. and Langendoen, D. T. eds. *Studies in Linguistic Semantics,* 55–61. Holt, Rinehart & Winston.

Morgan, J. (1969). 'On the treatment of presuppositions in transformational grammar', *CLS,* 5, 169–77.

Stalnaker, R. C. (1970). 'Pragmatics', *Synthese* 22, 1/2, 272–89.

Strawson, P. F. (1950). 'On referring', *Mind* 59, 320–344.

Van Fraassen, B. C. (1971) *Formal Semantics and Logic,* Macmillan, New York.